Summary of Significant Progress, Plans for Next Steps

Chapter 4

This Integrated Nuclear Materials Management Plan is the product of an initiative at the highest levels of the Department, and it responds to a congressional directive. The Department launched the NMSI to accelerate the work of achieving integration and reducing future costs associated with the management of nuclear materials. Chartered in January 2000, the principal focus of NMSI is excess materials.

This chapter closes the Department's discussion of opportunities to integrate and optimize the way in which it manages nuclear materials. Recent progress in the field in reducing risks associated with our nuclear materials inventory and progress in more closely integrating management of them is recapped here. The chapter also offers a summary of actions that will be undertaken to move the Department toward a more corporate approach to nuclear materials management, support strategic long-term planning, and minimize future costs.

Estimates of the annual cost of managing these materials demonstrate that they demand a significant portion of the Department's annual budget. The Department's baseline plans for the next decade call for capital spending on upgraded or new facilities in order to carry out surplus materials disposition and other missions. Additional capital spending may also be necessary if the nation is to maintain a robust nuclear materials complex for the decades ahead. Furthermore, in order to achieve substantial savings over the long term, increased investments may be needed in the near term. In light of these realities, it is therefore particularly crucial that nuclear materials management is optimized for integration and efficiency.

The Department has identified a number of near-term actions that promise to strengthen and integrate management of nuclear materials. Implementing these actions will help ensure that the treatment, storage, and disposition of nuclear materials will be managed economically and efficiently, and that the nuclear materials complex will be adequately prepared to meet mission requirements over the coming decades. The Council's multi-year agenda is summarized in Table 4-1. As the NMC continues to implement this important agenda over the next few years, the Department will report on its progress in the Strategic Plan and through its annual budget requests. This agenda will be regularly reviewed and adjusted as needed to accommodate changing circumstances.

Building on Success

The Department has made significant progress reducing risks from nuclear materials storage conditions and in responding to concerns raised by the DNFSB. It is also moving ahead with plans for the disposition of surplus fissile materials, including Pu-239 and HEU. Highlights are summarized below.

Stabilization and storage

- Most sites have repackaged plutonium metal and oxides that were in unstable packaging configurations. The Department is now stabilizing and packaging nuclear materials and repackaging certain pits.
- Deteriorating spent fuel elements at INEEL have been moved to a basin where control of water purity is much better, and both INEEL and Hanford are developing dry storage facilities so that fuel can be moved from wet to dry storage.
- Substantial amounts of at-risk spent nuclear fuel and targets have been chemically processed to place them into forms suitable for long-term storage.
- Most of the plutonium solutions at SRS and Rocky Flats have been converted to metal and oxide, respectively, and packaged for safe, long-term storage.
- Plutonium residues are being repackaged, with some stabilization and blending, so they can be shipped to WIPP, which is now an operating disposal site for TRU waste.
- It is planned to convert DUF_6 into more stable forms of metal or oxide or both for long-term storage pending reuse and to stabilize U-233 for long-term storage pending reuse or disposal.

Disposition of excess materials

The Department now has disposition paths for excess plutonium and surplus HEU, as a result of Records of Decision under NEPA. The hybrid approach for disposition of excess plutonium, will use both immobilization and MOX fuel technologies. The endpoint will be disposal of immobilized plutonium or spent MOX fuel in a geologic repository. HEU will be blended down to LEU for use as commercial reactor fuel or for disposal.

The Department will continue to identify and evaluate options for dispositioning excess materials that currently lack disposition paths. These materials include surplus HEU, NU, DU, and various orphan materials.

Facility life-cycle planning and mortgage reduction

The Department has a substantial investment in the facilities needed to manage its large inventory of nuclear materials. These facilities are distributed at sites throughout the country and among many program offices. The facilities are continually being maintained, modified, or closed based on site or programmatic drivers. In 1998, the Department revised its Life-Cycle Asset

Table 4-1 Multi-year Agenda for the Nuclear Materials Council

Policy and Organizational Changes

- Policy
  1. Revise the Department's Strategic Plan to ensure that Nuclear Materials Stewardship is integrated into the Department's major missions.
  2. Update DOE Order 5660.1B - Management of Nuclear Materials - to include nuclear materials stewardship missions, including the responsibilities of the Nuclear Materials Council and the Nuclear Materials Stewardship Task Force.
  3. Establish a "National Resource Policy" that identifies the criteria to be applied when determining whether excess legacy nuclear materials that do not currently have a disposition path specified should be maintained for a future use or disposed of.
- Organization and Budget
  4. Review the costs for managing nuclear materials within the Department.
  5. Develop options and select an approach for institutionalizing a Nuclear Materials Stewardship staff coordination function.
  6. Evaluate the costs and benefits of establishing nuclear material management groups and formally charter those that will serve corporate nuclear materials management needs.
  7. Complete, in time for the FY 2003 budget process, a strategy document to establish the acceptance criteria, programmatic requirements, and budget requirements needed to guide any future transfer of certain "national resource" materials to the Office of Nuclear Energy, Science and Technology.
  8. Investigate opportunities to apply proceeds from surplus materials sales to help offset their disposition costs.
- Planning, Analysis, and Decision Making
  9. Make planning decisions, subject to NEPA review, concerning high-priority, cross-program issues, including the disposition of legacy nuclear materials, americium, curium, neptunium, uranium-233, strontium and cesium, among others.
  10. Complete a cost/benefit, business-case analysis of alternatives for improving the Department's nuclear materials information management and inventory accountability system and upgrade and integrate to the degree appropriate.
  11. Convene a cross-program team to integrate planning for the disposal of defense high-level nuclear waste and Department-owned spent nuclear fuel in a repository and to address safeguards and security licensing requirements.
  12. Establish an integrated planning and decision making process for facilities and infrastructure required to meet the needs of a modernized nuclear materials management complex.
  13. Perform a qualitative and quantitative projection of the long-term capabilities needed to perform the Department's nuclear materials management missions.
  14. Develop policy-level decision support tools to support long-term planning and decision making.
  15. Assess opportunities to integrate and enhance nuclear materials research and development.
  16. Develop Web-based tools for sharing information and facilitating coordination among Departmental programs and between Headquarters and the field on topics directly related to the Council's evolving agenda.
- Stakeholder and Public Involvement
  17. Establish appropriate mechanisms and opportunities for involving the public on issues that could affect them.

Improving Operations

- Plutonium
  18. Implement decisions from integrated assessment of plutonium storage consolidation.
  19. Implement decisions from integrated assessment of plutonium stabilization.
  20. Configure the three plutonium disposition facilities to take advantage of existing and planned infrastructure to achieve improved schedules, cost savings, and other programmatic synergies.
- Uranium
  21. Complete integrated assessment of uranium missions and facilities, including a method for consolidating uranium storage.
  22. Complete analysis of non-HEU opportunities and recommend improvements.
- Transportation and Containers
  23. Evaluate the protocols and practices used by shippers of radioactive materials and wastes.
  24. Design a financial charge-back approach for non-national security shipments of nuclear materials.
  25. Evaluate consolidation and streamlining of nuclear materials package management.

Management Order [DOE Order 430.1A] to address the challenges of decontaminating and decommissioning excess facilities. The Department's Field Management Council, chaired by the Deputy Secretary, is currently addressing implementation issues associated with the transfer of excess facilities for disposition to EM.

The Department has declared excess and is in the process of decontaminating and decommissioning 5,000 of the 20,000 facilities in the complex. The Department will continue its effort to reduce the "mortgage" associated with maintaining excess facilities so that it can reapply savings to other nuclear materials management priorities such as reducing vulnerability of at-risk materials, cleanup, and repairs to facilities.

An integrated Department-level process for making decisions about facility commissioning, use, and closure and for future facilities planning will become institutionalized.

Organizational and Policy Change

The NMSI was chartered by the Under Secretary to better coordinate efforts across the Department's program offices. NMSI both institutionalizes and formalizes the decision-making process for the cross-program management of nuclear materials. High priority cross-program issues already being addressed include the following:

- disposition of americium and curium, U-233, cesium and strontium, and plutonium-contaminated HEU and maintaining certain of these materials as "national resources;" and
- cost sharing for use of services, facilities, or processes.

Other immediate and near-term actions being implemented are the following:

- The Department will continue to aggressively work cross-program issues and reach timely decisions in order to ensure safe storage and disposition and meet mission needs. NMSI follows a systematic process for making decisions on cross-program issues. A decision could require analyses under the NEPA process or specific fact-finding by one or more program offices.
- The Department will establish a policy for determining if surplus nuclear materials that do not currently have a disposition path defined are to be maintained as a national resource or disposed of, and the Department will assign program responsibility for implementing the outcome of each decision.
- The Department will complete a business case analysis for meeting its nuclear materials information management and inventory accountability needs. The analysis is underway, involves all programs and field offices with nuclear materials management responsibilities, and is being accomplished in partnership with the Department's Chief Information Officer.
- The Department will evaluate the option of establishing nuclear material management groups. To help maintain a core level of technical expertise and facility processing capability and to facilitate integration, the Department will evaluate the following nuclear materials management groups similar to the National Spent Nuclear Fuel Program established in 1996 at INEEL:
  - plutonium management group,
  - uranium management group,
  - non-actinide isotopes and sealed sources management group, and
  - heavy isotopes group.

Improving Future Operations

Storage and stabilization

The Department will continue to address near-term storage vulnerabilities by stabilizing at-risk materials and placing them in safer packages and facilities. Since storage represents about half the costs associated with management of nuclear materials, integration or consolidation of materials storage and stabilization should produce meaningful cost savings, as well as boost efficiency. We are currently addressing the following operational improvements:

- backfitting an existing facility for stabilizing and packaging SRS plutonium rather than build a new facility;
- consolidating storage for stabilized materials from Rocky Flats, LLNL, and LANL that can be provided by a facility such as the SRS KAMS facility; and
- consolidating HEU storage at Oak Ridge's Y-12 Plant to accelerate site closures and avoid storage costs and reallocating them to meet unfunded liabilities relating to at-risk materials and safe facilities.

The Department will conduct further analyses, including NEPA analysis as appropriate, for some options before making decisions.

Involving the Public in Departmental Decision Making

For unclassified matters pertaining to management of nuclear materials, the Department seeks the benefit of diverse views and expertise. The Department will use established mechanisms to involve its stakeholders and the general public in its activities. Cross-program decisions could require NEPA analyses that will provide opportunities for public involvement. The Department will also continue interactions and discussions with stakeholders through:

- early and continuing coordination with Site-Specific Advisory Boards, and other public groups at affected sites;
- periodic meetings with members of congressional delegations and State, Tribal, and local governments;
- continued dialogue through existing forums on the national level, such as with the National Governors' Association, State and Tribal Government Working Group, the Energy Communities Alliance, Site-Specific Advisory Board Chairs, and Environmental Management Advisory Board and other Department advisory groups; and
- continued dialogue with organized non-govermental organizations who claim a stake in these issues.